IS 4257-1 (1981): Dimensions for Clamping Arrangements for Porcelain Transformer Bushings, Part I: For 12 kV to 36 kV Bushings [ETD 6: Electrical Insulators and Accessories]

BLANK PAGE

IS : 4257 (Part 1) - 1981
(Reaffirmed 2004)
Edition 2.1
(1989-08)

Indian Standard

DIMENSIONS FOR CLAMPING ARRANGEMENTS FOR PORCELAIN TRANSFORMER BUSHINGS

PART 1 FOR 12 kV to 52 kV BUSHINGS

(First Revision)

(Incorporating Amendment No. 1)

UDC 621.315.626-229.312 : 006.78

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Group 2

Indian Standard

DIMENSIONS FOR CLAMPING ARRANGEMENTS FOR PORCELAIN TRANSFORMER BUSHINGS

PART 1 FOR 12 kV to 52 kV BUSHINGS

(First Revision)

Electrical Insulators and Accessories Sectional Committee, ETDC 3

Chairman	*Representing*
SHRI P. M. AHLUWALIA	Central Electricity Authority, New Delhi
Members	
DIRECTOR (TRANSMISSION) DEPUTY DIRECTOR (SUBSTATION) Shri P. M. Ahluwalia)	(*Alternate* to
SHRI U. R. G. ACHARYA	Directorate General of Posts & Telegraphs, Jabalpur
DEPUTY GENERAL MANAGER (T) (*Alternate*)	
SHRI R. S. ARORA SHRI ANIL GUPTA (*Alternate*)	Directorate General of Supplies and Disposals, New Delhi
SHRI D. S. CHABHAL	Directorate General of Technical Development, New Delhi
SHRI CHANDER PARKASH	Bengal Potteries Ltd, Calcutta
SHRI S. C. SEN (*Alternate*)	
SHRI R. T. CHARI	Tag Corporation, Madras
SHRI A. GURUPATHAM (*Alternate*)	
SHRI A. K. CHOPRA	Punjab State Electricity Board, Patiala
SHRI K. K. PURI (*Alternate*)	
DIRECTOR (TRACTION INSTALLATION)	Research Designs and Standards Organization, Ministry of Railways, Lucknow
JOINT DIRECTOR /TI-I (*Alternate*)	
SHRI K. R. KASHYAP SHRI A. K. AGARWAL (*Alternate*)	High Tension Insulator Factory, Ranchi

(*Continued on page 2*)

(*Continued from page* 1)

Members	*Representing*
SHRI B. KRISHNAMOORTHY	Bharat Heavy Electricals Ltd, Bhopal
SHRI M. L. MITTAL (*Alternate* I)	
SHRI R. SUBBA RAO (*Alternate* II)	
SHRI I. C. KUPPUSWAMY	Tamil Nadu Electricity Board, Madras
SHRI N. R. SANKARAN (*Alternate*)	
SHRI H. M. S. LINGAIAH	Karnataka Electricity Board, Bangalore
SHRI S. K. MUKHERJEE	National Test House, Calcutta
SHRI P. C. PRADHAN (*Alternate*)	
DR G. M. PHADKE	Indian Electrical Manufacturers Association, Bombay
SHRI P. RAMACHANDRAN(*Alternate*)	
SHRI P. S. RAMAN	New Government Electric Factory Ltd, Bangalore
SHRI E. P. WILFRED (*Alternate*)	
SHRI H. K. RATHI	Maharashtra State Electricity Board, Bombay
SHRI V. N. RIKH	U. P. State Electricity Board, Lucknow
SHRI V. B. SINGH (*Alternate*)	
SHRI P. K. SAXENA	Rural Electrification Corporation, New Delhi
SHRI G. L. DUA (*Alternate*)	
SHRI R. D. SHETH	Electro Metal Industries, Bombay
SHRI G. M. SRIKANTAN	W. S. Insulators of India Ltd, Madras
SHRI R. G. V. VANCHEESWARAN (*Alternate*)	
SHRI SURENDRA SINGH	Government Pottery Development Centre, Khurja (U. P.)
SHRI T. B. L. SRIVASTAVA (*Alternate*)	
SHRI L. VENKATESUBBU	Seshasayee Industries Ltd, Madras
SHRI R. V. ACHUTHAN (*Alternate*)	
SHRI S. P. SACHDEV, Director (Elec Tech)	Director General, ISI (*Ex officio Member*)

Secretary

SHRI JOSE MATHEW
Assistant Director (Elec tech), ISI

Panel for Dimensions of Bushings, ETDC 3/P3

Convener	
SHRI V. SRINIVASAN	W. S. Insulators of India Ltd, Madras
Members	
SHRI S. V. MANERIKAR	Crompton Greaves Ltd, Bombay
SHRI M. L. MITTAL	Bharat Heavy Electricals Ltd, Bhopal
SHRI S. P. SINGH (*Alternate* I)	
SHRI B. KRISHNAMOORTHY (*Alternate* II)	
SHRI R. G. PRADHNANI	Bharat Bijlee Ltd, Bombay
SHRI P. RAMACHANDRAN	Transformers & Electricals Kerala Ltd, Angamally
SHRI KURIAKOSE ANTONY (*Alternate*)	
SHRI P. S. RAMAN	New Government Electric Factory Ltd, Bangalore
DR U. S. SINGH	High Tension Insulator Factory, Ranchi
SHRI A. D. DUA (*Alternate*)	

Indian Standard

DIMENSIONS FOR CLAMPING ARRANGEMENTS FOR PORCELAIN TRANSFORMER BUSHINGS

PART 1 FOR 12 kV to 52 kV BUSHINGS

(First Revision)

0. FOREWORD

0.1 This Indian Standard (Part 1) (First Revision) was adopted by the Indian Standards Institution on 16 December 1981, after the draft finalized by the Electrical Insulators and Accessories Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard (Part 1) deals with the dimensions of clamping arrangements for bushings of 12 kV to 52 kV rating to be used with transformers. The materials for the parts have also been specified. The dimensions of clamping arrangements for bushings of 72.5 kV and 123 kV rating are covered in Part 2 of this standard. Dimensions for porcelain and metal parts of the bushings are covered in different parts of IS : 3347* and IS : 8603†.

0.3 This standard was first issued in 1967. This revision has been necessitated by the recent industrial and technological developments in the design and manufacture of transformers and their associated accessories. The dimensions of porcelain transformer bushings for use at various voltage levels have been modified in order to align with the international practice.

0.4 In the preparation of this standard, assistance has been derived from DIN 42538 'Transformers, clamping arrangement for bushings' issued by Deutscher Normenausschuss.

0.5 This edition 2.1 incorporates Amendment No. 1 (August 1989). Side bar indicates modification of the text as the result of incorporation of the amendment.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated

*Dimensions for porcelain transformer bushings for use in normal and lightly polluted atmospheres.

†Dimensions for porcelain transformer bushings for use in heavily polluted atmospheres.

expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part 1) covers the clamping arrangements for bushings of 12 kV to 52 kV rating, to be used with transformers.

2. MATERIAL

2.1 The material of various parts shall conform to the relevent Indian Standards as specified below:

Part	*Material*
Clamping ring (Type A) (*see* Fig. 1)	Cold rolled carbon steel sheet, grade D according to IS : 513-1973†
Clamping ring (Type B) (*see* Fig. 2)	Cold rolled carbon steel sheet, grade D according to IS : 513-1973†
Clamping ring (Type C and D) (*see* Fig. 2)	Aluminium alloy 31 000 H_1 according to IS : 737 1974‡. Semifinished material according to sheet 3.15 mm thick of IS : 2676-1964§
Clamping member (Type E) (*see* Fig. 3)	Zinc base alloy 2 according to IS : 713 1966‖ or aluminium alloy 4 600 M designation according to IS : 617 1975¶.
Clamping member (Type F) (*see* Fig. 4)	Zinc base alloy 2 according to IS : 713 1966‖ or aluminium alloy 4 600 M designation according to IS : 617-1975¶.

*Rules for rounding off numerical values (*revised*)

†Specification for cold rolled carbon steel sheets (*second revision*).

‡Specification for wrought aluminium and aluminium alloys, sheet and strip (for general engineering purposes) (*second revision*).

§Dimensions for wrought aluminium and aluminium alloys, sheet and strip.

‖Specification for zinc base alloy ingots for die castings (*first revision*).

¶Specification for aluminium and aluminium alloy ingots and castings for general engineering purposes (*second revision*).

3. TOLERANCE

3.1 Unless specified otherwise, allowable tolerance on dimensions of any machined part shall be in accordance with medium class of IS : 2102-1969*.

3.2 Unless specified otherwise, allowable tolerance on dimensions of any forged or cast part shall be in accordance with the coarse class of IS : 2102-1969*.

4. SURFACE FINISH

4.1 The surface finish for ferrous parts shall be hot-dip galvanising according to IS : 4759-1968†, zinc plating according to IS : 1573-1970‡ or cadmium, plating with chromate passivation Cd 8 Cr according to IS : 1572-1968§ subject to agreement between the manufacturer and the purchaser.

4.2 The surface finish for non-ferrous parts shall be electrotinning according to IS : 1359-1977|| subject to agreement between the manufacturer and the purchaser.

5. DIMENSIONS

5.1 Clamping Ring

5.1.1 The dimensions of clamping ring Type A shall conform to Fig. 1.

5.1.2 The dimensions of clamping ring Types B, C and D shall conform to Fig. 2.

5.2 Clamping Member

5.2.1 The dimensions of clamping member Type E shall conform to Fig. 3.

5.2.2 The dimensions of clamping member Type F shall conform to Fig. 4.

6. METHOD OF CLAMPING

6.1 The method of clamping and relevant dimensions shall be as shown in Fig. 5.

---

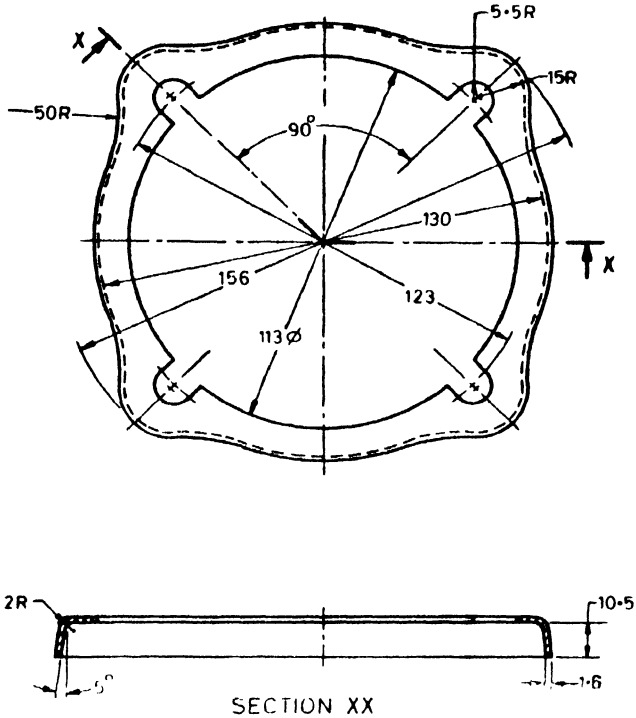
*Specification for allowable deviations for dimensions without specified tolerances (*first revision*).

†Specification for hot-dip zinc coatings on structural steel and other allied products.

‡Specification for electroplated coatings of zinc on iron and steel (*first revision*).

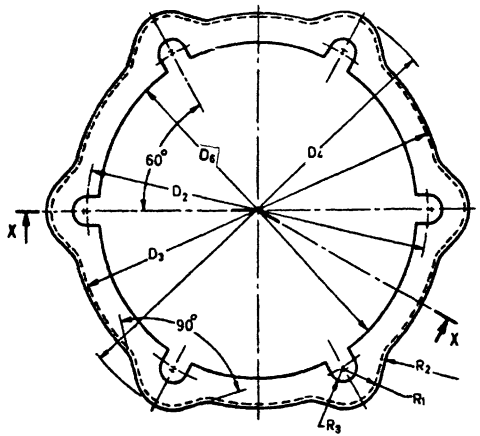
§Specification for electroplated coatings of cadmium on iron and steel (*first revision*).

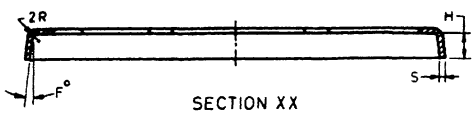
||Specification for electroplated coatings of tin (*second revision*).



All dimensions in millimetres.

FIG. 1 CLAMPING RING — TYPE A



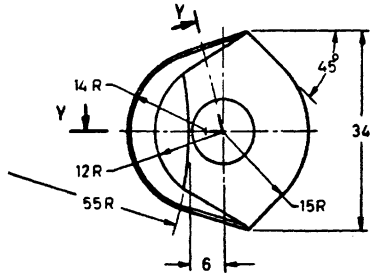


SECTION XX

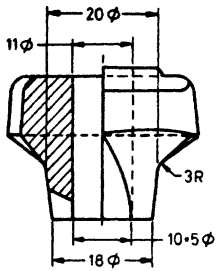
CLAMPING RING. TYPE	D_2	D_3	D_4	D_6	F	H	S	R_1	R_2	R_3
B	140	150	173	130	5°	10.5	1.6	15	10	5.5
C	180	194	222	166	9°	13	3	18	15	7
D	200	214	242	186	9°	13	3	18	15	7

All dimensions in millimetres.

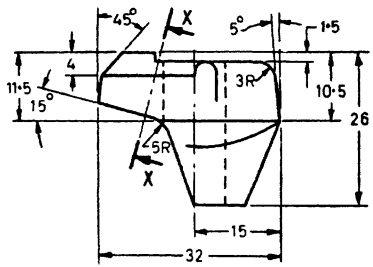
FIG. 2 CLAMPING RING (TYPES B, C AND D)



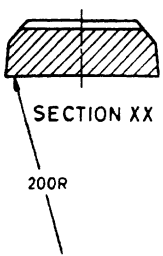
TOP PLAN

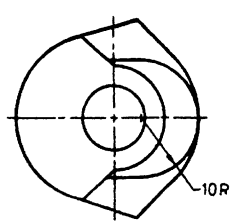


SECTION YY



ELEVATION

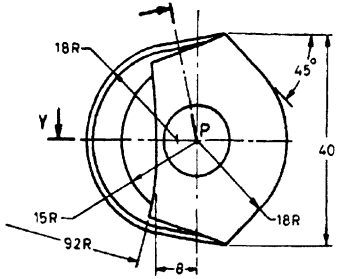




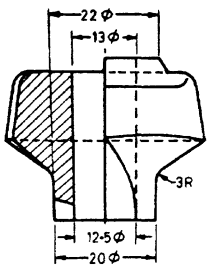
BOTTOM PLAN

All dimensions in millimetres.

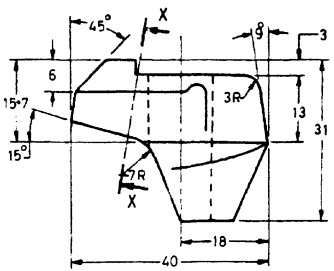
FIG. 3 CLAMPING MEMBER — TYPE E



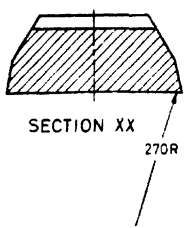
TOP PLAN

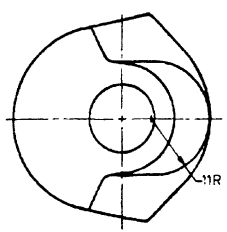


SECTION YY



ELEVATION

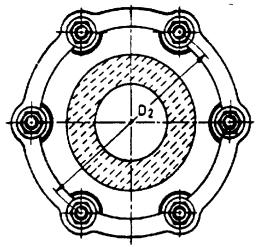


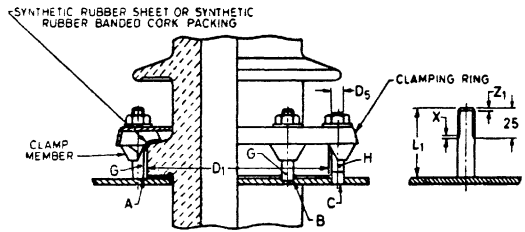


BOTTOM PLAN

All dimensions in millimetres.

FIG. 4 CLAMPING MEMBER — TYPE F





D_1	D_2	D_5	L_1	Clamping Ring Type	Clamping Member		Bushing Rating, kV/A	
					Type	Number Required	For Bushings with Aluminium Stem	For Bushing with Copper Stem
111^{-0}_{-7}	123	M10	55	A	E	4	12, 17.5/250, 24/250	12, 17.5/250, 24/250 36/250
128^{-0}_{-8}	140	M10	55	B	E	6		12, 17.5/630, 24/630 36/630
163^{-0}_{-10}	180	M12	65	C	F	6	12, 17.5/630, 24/630, 36/630	12, 17.5/1 000, 24/1 000, 36/1 000
183^{-0}_{-12}	200	M12	65	D	F	6	12, 17.5/1 000, 2 000, 24/1 000, 2 000, 36/1 000, 2 000	12, 17.5/2 000, 3 150, 24/2 000, 3 150, 36/2 000, 3 150

NOTE — Thread end Z_1 and thread runout X shall be according to IS : 1368-1967* and IS : 1359-1975†.

The dimensions of clamps for 36 kV bushings shall be applicable to 52 kV bushings also.

All dimensions in millimetres.

FIG. 5 METHOD OF CLAMPING

*Dimensions of ends of bolts and screws (*first revision*).

†Dimensions of screw thread run-outs and undercuts (*first revision*).

This Indian Standard has been developed by Technical Committee : ETDC 3

Amendments Issued Since Publication

Amend No.	Date of Issue
Amd. No. 1	August 1989

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002. Telegrams: Manaksanstha
Telephones: 323 01 31, 323 33 75, 323 94 02 (Common to all offices)

Regional Offices:		Telephone
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	323 76 17 323 38 41
Eastern	: 1/14 C. I. T. Scheme VII M, V. I. P. Road, Kankurgachi KOLKATA 700054	337 84 99, 337 85 61 337 86 26, 337 91 20
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160022	60 38 43 60 20 25
Southern	: C. I. T. Campus, IV Cross Road, CHENNAI 600113	235 02 16, 235 04 42 235 15 19, 235 23 15
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	832 92 95, 832 78 58 832 78 91, 832 78 92

Branches : AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. NALAGARH. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM. VISHAKHAPATNAM